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Collaboration Challenges for a Global Organization With Distributed Personnel

CAPSTONE REPORT

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Abstract

The purpose of this study is to examine the collaboration challenges global organizations face with distributed personnel. The annotated bibliography, intended for virtual team leaders and team members, provides resources that address the collaboration challenges global companies face with virtual teams, describes advantages and disadvantages of virtual teams, and identifies best practices and technology to address the challenges posed by virtual teams.

Keywords: virtual team, dispersed team, distributed team, collaboration, challenges, global organization, GVT, technology

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Introduction to the Annotated Bibliography

Problem Statement

As more companies become global, an international presence can aid in meeting the demands of the customer (Johanson & Mattsson, 2013). "Establishment of sales subsidiaries is probably speeded up by high internationalization, as the international knowledge level is higher and there is a stronger need to co-ordinate activities in different markets" (Johanson & Mattsson, 2013, p. 305). An organization with multiple locations and geographically dispersed workers typically results in virtual teams (Dulebohn & Hoch, 2017, p. 1). For the purposes of this capstone paper, the term dispersed teams or virtual teams refers to "geographically, organizationally, or time-dispersed workers using information and telecommunications technology to facilitate collaboration" (Plotnick, Hiltz, & Privman, 2016, p. 203). The practices of using virtual teams "are becoming common organizational structures because firms seek to leverage geographically distributed, specialized knowledge to execute work" (Iorio & Taylor, 2015, p. 395).

The use of virtual teams has caused fundamental shifts in the organizations that employ them (Laurito, 2010). "These teams have shifted the way in which organizations traditionally form, manage and evaluate team performance" (Laurito, 2010, p. 31). These changes include how team members are selected, organizational structure, leadership functions and practices, methods of communication and decision-making, relationship building, and physical contact (Lilian, 2014).

Organizations that have dispersed personnel have recognized that the use of virtual teams provides benefits (Grimes & Whitmyer, 2009). "In recent years companies have increasingly turned to virtual teams as a means of connecting and engaging geographically dispersed workers,

lowering the costs associated with global collaboration, and enabling greater speed and adaptability" (Laurito, 2010, p. 31). Utilizing distributed personnel helps companies increase productivity for some business functions if they strategically assign dispersed personnel in different locations around the world (University of Aberdeen, n.d.). Using virtual teams leads to five other benefits, including cost savings, labor pool enhancement, facility and environmental benefits, employer efficiencies, and employee efficiencies (DuFrene & Lehman, 2011).

One of the biggest advantages for a company that employs virtual teams is cost savings (Purvanova, 2014). "First, virtual teams have been linked with significant savings, due to reduction in travel expenses, meeting times, duplication costs and other logistical expenditures" (Purvanova, 2014, p. 2). Virtual teams also enable the recruitment of the strongest team members because they have dispersed personnel throughout the world; talent can be hired anywhere rather than restricting the labor pool to a centralized office (DuFrene & Lehman, 2011).

Virtual teams also bring efficiencies to both the employer and employee. "Virtual teams can increase efficiency by eliminating layers of management and valuable time lost to bureaucratic processes. Such teams also enable organizations to combine the specific talents of employees located in various places" (DuFrene & Lehman, 2011, p. 6). DuFrene and Lehman (2011) also found that virtual team members have increased satisfaction because they are better able to balance their work and personal lives. Virtual teams also increase employee satisfaction by helping the employees to feel more empowered in shaping their own jobs (DuFrene & Lehman, 2011).

Advantages to the environment are also imparted with the increased adoption of virtual teams (DuFrene & Lehman, 2011). With more employees working from home the need for office facilities and parking spaces is lower than when employees work from an office location

(DuFrene, & Lehman, 2011). "Air pollution and traffic congestion are also reduced when fewer workers commute daily" (DuFrene & Lehman, 2011, p. 5).

While there are clear benefits when utilizing virtual teams, there are also disadvantages (Kirkman, Rosen, Gibson, Tesluk, & McPherson, 2002). Building and establishing trust is the biggest challenge when attempting to succeed with a virtual team (Kirkman et al., 2002). "Trust has been called the glue of the global workplace" (Kirkman et al., 2002, p. 69). Many employees believe that the group-process gains (positive energy) produced in a face-to-face team environment are difficult to obtain in virtual teams, and that process losses (negative synergy) are more likely (Kirkman et al., 2002).

Another big disadvantage for virtual teams is the lack of physical interaction, which leads to isolation (Kirkman et al., 2002). Workplace loneliness can arise from remote employees' lack of verbal cues and social interaction with other employees and supervisors due to their locations outside of the office (Kirkman et al, 2002). Managers also face challenges overseeing teams they do not see (Kirkman et al., 2002). "A major challenge for managers in their inability to physically observe their employees' performance" (Kurland & Bailey, 1999, p. 59).

The global nature of business and the advantages of a distributed workforce have led to the proliferation of virtual teams (Laurito, 2010). While virtual teams are becoming indispensable to many global companies, these team structures pose unique challenges, particularly in the area of collaboration (Laurito, 2010). Best practices and technology that hold promise in addressing these challenges are needed to ensure the success of this growing workplace model (DuFrene & Lehman, 2011).

Purpose Statement

This capstone paper explores the collaboration challenges for a global organization with distributed personnel and the tools and best practices that are available to make virtual teams successful. Specific topics include how social aspects differ in globally distributed teams, best practices for successful collaboration among distributed project team members, and technology that enhances collaboration for remote employees.

Research Questions

This capstone paper addresses the following questions:

Main question: What are the best practices and tools to meet the collaboration challenges faced by global organizations with distributed personnel?

Sub-questions:

- What are the reasons virtual teams are unsuccessful?
- What factors lead to the success of virtual teams?

Audience

This study describes the challenges a global company faces when collaborating with a dispersed team. The intended audience for the study includes stakeholders within global organizations, including chief information officer (CIO), chief operating officer (COO), information technology (IT) director, help desk manager, project manager, human resource (HR) directors and the remote IT staff. The identified stakeholders all share an interest in ensuring that remote teams adopt best practices to be successful. Stakeholders can use this information to find ways to ensure that collaboration within a dispersed work teams is more successful.

CIOs are key stakeholders for this study. Chun and Mooney (2006) of Pepperdine University identified the following CIO roles and responsibilities in their research:

- "CIOs are tasked with invigorating the firm's existing IT infrastructure and achieving a return on investment (ROI) on the company's previous IT investments" (p. 3095).
- "CIOs are commissioned by the Chief Executive Officers (CEO) to work with the business to control and reduce internal operating costs" (p. 3097).
- "CIOs are tasked to enable business agility and to facilitate the delivery of new business value in the short term through innovative IT investments" (p. 3098).
- "CIOs are tasked with better managing corporate risks, such as developing and implementing protective internal and external security measures, ensuring compliance with industry regulations, and enforcing IT governance initiatives" (p. 3098).

Given the responsibilities of a CIO, this study is of interest because the decision of the technology that will enable successful communication and collaboration with virtual teams is ultimately the CIO's charge when devising the organization's overall IT technology plan. Selection of the right technology to promote collaboration among virtual teams will enable the CIO to reduce operating costs and maximize the value of the investment.

The chief operating officer (COO) is essentially the second in command of an organization (Bennett & Miles, 2006). "The one role of a COO is to lead the execution of strategies developed by the top management team" (Bennett & Miles, 2006, p. 2). This study is of interest to the COO because he/she will be charged with implementing the best practices identified to optimize the use of virtual teams.

An IT director's responsibilities "range from strategy to operations. Many IT directors seem to struggle to spend more time on strategy and less time on operations" (Gottschalk, 2000, p. 43). This study is of interest to the IT director because he/she will be responsible for developing a technology strategy for virtual teams and executing the plans to meet the strategies.

The help desk manager will be tasked with assisting remote and local staff with any of the collaboration and communication software solutions that are used for virtual teams (Serbest Goksen, Dogan, & Tokdemir, 2015). The help desk analysts are the first level of support for both remote and local staff who have issues with the tools they are using to communicate with one another.

Project managers of international organizations often have employees working remotely who need to collaborate to complete tasks or projects (Henderson, Stackman, & Lindekilde, 2016). Each project manager communicates with employees to better understand the needs of the business and collaborates with them to complete tasks. Understanding how to foster more successful collaboration among remote team members helps these project managers to be more successful in their organizational roles.

The human resource (HR) directors are generally responsible for recruiting, employee relations, benefits, and training (Galagan, 2014). The HR directors are important to the success of virtual teams because they identify employees or contractors to fill the roles in the team. HR directors have a difficult task of recruiting employees across all time zones in a global organization (University of North Carolina. Kenan-Flagler Business School, 2017).

Finally, the staff members who work remotely need to understand the root cause of the challenges of working in dispersed teams and find better processes to collaborate and achieve the ultimate goal of successfully completing a project or providing services to customers.

Search Report

Search Strategy. Much information regarding remote work exists on the internet. There are also numerous articles that describe the advantages and disadvantages of employing remote workers. Scholarly articles regarding the challenges that global organizations with distributed work teams face were easy to locate. Key word searches were utilized to locate scholarly articles and documents that were relevant to the research focus. Articles published within the last 10 years were selected due to the evolving nature of technology.

Search engines and databases. The University of Oregon Libraries was the primary search engine for scholarly articles and documents. Google Scholar was the secondary search engine to locate scholarly articles and documents not available through the UO Libraries. Specific databases of reference from the UO Libraries included Business Source Complete (EBSCO host), JSTOR, and Academic OneFile.

Keywords.

- Remote jobs,
- Telecommuting jobs,
- Benefits of remote jobs,
- Advantages/disadvantages of remote jobs,
- Percentage of remote employees in U.S.,
- Reasons to not allow remote work,
- Pros and cons of working from home office,
- Remote technology,
- IT companies employees remote work,
- Collaboration challenges for global organization,

- Collaboration challenges with distributed personnel,
- Global company with dispersed teams,
- International presence global company,
- Global virtual team,
- Virtual teams are becoming common,
- Virtual teams in organizations,
- Why choose virtual teams?,
- Virtual teams global awareness in international markets,
- Virtual team advantage cost savings,
- Virtual team challenges,
- Leadership roles in technology,
- Technology in virtual teams,
- Virtual teams successful technology,
- Virtual team use of technology, and
- Collaboration is challenging for a global organization with distributed personnel.

Documentation Method

Documentation approach. The entire project along with each reference was saved to a Microsoft Word document, backed up in an e-mail, and saved on a USB drive to ensure a secure back-up. The e-mail backup ensured that the project and references could be accessible anywhere and provided a copy in case the Microsoft Word program and/or USB drive got corrupted.

The annotated bibliography and references included were cited according to the American Psychological Association (APA) guidelines. Keyword searches were saved on the same Microsoft Word document that housed the annotated bibliography and references. The

Microsoft Word document included the link to the articles or documents, the author(s) of the documents, and the keywords used to find those articles/documents. Each reference was categorized based on three categories: (a) advantages and disadvantages associated with virtual teams, (b) best practices of virtual teams, and (c) technology associated with virtual teams.

Reference Evaluation

Reference evaluation criteria. References were evaluated based on the list of criteria provided by the Center for Public Issues Education (n. d.):

- Authority - Each document was evaluated to validate the author's credentials and determine if his/her educational history or previous employment had relevancy to the research topic. Authors were selected who are currently associated with reputable organizations. Sources that have been cited by others were given preference. The website of the publisher was examined to better understand its basic values and goals to determine its knowledge and experience in virtual teams.
- Timeliness - The topic of this capstone study involves technology and technology is constantly evolving; sources were, therefore, selected where the publication date did not exceed 10 years prior to the current year.
- Quality - References were evaluated based on the quality of the document, including grammar, spelling, and punctuation. Documents that contained excessive errors were discarded.
- Relevancy - The articles and documentations used for this study must be related to collaboration challenges for a global organization with distributed personnel. Only articles and documentation from a scholarly source or reputable publisher related to virtual team communication and challenges were used for this study.

- Bias - The content of each source was assessed to ensure the author did not present a biased opinion on the subject matter; sources were avoided where the author attempted to persuade the reader to a personal viewpoint. Sources were selected that included different perspectives as opposed to being one-sided. The introductions and conclusions of reference sources were examined to determine if opposing viewpoints were acknowledged or addressed. Lastly, sources were selected where the author's arguments and conclusions were supported by credible and cited sources.

Annotated Bibliography

The annotated bibliography section provides 16 references that address the research question of why collaboration is challenging for global organizations with distributed personnel. The 16 references are divided into three sections: advantages and disadvantages of virtual teams, best practices of virtual teams, and technology for use with virtual teams. These references will aid in shaping the context of this paper along with providing scholarly context to answer the research questions: What are the best practices and tools to meet the collaboration challenges faced by global organizations with distributed personnel? What are the reasons virtual teams are unsuccessful? What factors lead to the success of virtual teams?

The annotated bibliography is structured in APA format and contains three elements for each annotation: the formal citation, the published abstract, and a summary of the reference.

Advantages and Disadvantages of Virtual Teams

DuFrene, D. D., & Lehman, C. M. (2012). Growth in popularity of virtual teams. In *Managing virtual teams* (pp. 3-10). New York, NY: Business Expert Press. Retrieved from http://site.ebrary.com.libproxy.uoregon.edu/lib/univoregon/reader.action?docID=10514933

Abstract. Virtual teams are an integral part of today's global business environment. Traditional face -to-face communication is frequently replaced with technology-mediated communication methods including phone, e-mail, fax, synchronous chat programs, and videoconferencing. While virtual teams offer various advantages to organizations and individuals in flexibility and the ability to overcome geographic distance, they face unique challenges. Virtual teams are often made up of members of various cultures and ages with diverse communication styles. Men and women also tend to behave differently in virtual environments.

Challenges occur in the forming, storming, norming, and performing phases of team development, and virtual teams must be able to cope effectively with those obstacles if they are to be successful and reach their potential. Team participants should be selected carefully for various personal characteristics that help ensure success and be trained in how to be effective virtual team members. Various team strategies can be implemented to improve effectiveness and satisfaction of virtual team members.

Summary. This book focuses on the growth in popularity of virtual teams and presents the advantages and challenges faced by virtual teams. According to DuFrene and Lehman (2011), virtual teams have experienced some success due to the evolution of technology that allows virtual team members to communicate and collaborate with each other. Virtual teams offer six categories of benefits: cost savings, labor pool enhancement, facility and environmental benefits, employer efficiencies, employee efficiencies, and better decision making. However, despite the advantages, DuFrene and Lehman present the real challenges virtual teams may encounter. These include lack of verbal cues, isolation, lack of cohesion, and the absence of essential behaviors such as commitment, cooperation, communication, and contribution.

This source is important for this study because it explores various reasons why virtual teams are successful and unsuccessful.

Heller, R. (2010). A cost-benefit analysis of face-to-face and virtual communication: Overcoming the challenges. In R. Heller, A. Laurito, K. Johnson, M. Martin, R. Fitzpatrick, & K. Sundin, *Global teams: Trends, challenges, and solutions: A collection of white papers* (pp. 9-28). Ithaca, NY: Center for Advanced Human Resources, IRL School, Cornell University. Retrieved from

https://est05.esalestrack.com/eSalesTrack/Content/Content.ashx?file=4578f59e-21b3-4a2c-bbfe-63e53af3f5dc.pdf

Abstract. Evolving technologies allow organizations to become increasingly global. This trend has led organizations to adopt virtual communication to face global challenges. As increasing numbers of organizations implement various virtual communication tools, face-to-face contact has shifted to virtual communication, bringing forth new opportunities and threats. This paper explores the debate between face-to-face and virtual communication and identifies the costs and benefits associated with each, in addition to identifying strategies for effectively utilizing virtual communication.

Summary. This chapter focuses on the advantages and disadvantages of virtual and face-to-face communication. The author, Rebecca Heller, notes that face-to-face contact facilitates the transfer of knowledge that is not written or definable but is gained through experience. Heller (2010) states that when communicating face-to-face, the speaker can see the visual cues that build trust within the face-to-face groups. Heller also notes the disadvantages of face-to-face communication, including the fact that bringing distributed team members together for face-to-face communication is often unrealistic and travel expenses can be high.

Heller (2010) points out that the advantages of having a virtual team includes the ability for an organization to increase globalization and allow for rapid knowledge transfer across different time zones. Another advantage is cost; virtual communication tools can offer a cost-effective way of communicating across time zones and of doing business. Disadvantages include technical and logistical problems that can occur with virtual communication tools, which can be time consuming to resolve. These issues may include scheduling, coping with time delays, and software issues.

Lilian, S. C. (2014, January 24). Opportunities and challenges for e-leaders. Procedia - Social and Behavioral Sciences, 110(2014), 1251 - 1261. Retrieved from https://doi.org/10.1016/j.sbspro.2013.12.972

Abstract. In the globalized world with crucial technological changes, leaders are facing unforeseen opportunities as well as challenges while striving to reach their objectives. Such changes have led to organizational restructurings and implied rethinking of leadership functions and practices. Changing organizational structures, from traditional hierarchical towards lower and more flexible ones, have made leaders organize work in new ways. Teams account for one new way of organizing work and reaching organizational goals. Likewise, globalized markets have made leaders search for new solutions to meet the needs of customers. In consequence, organizations strive for competitive advantages through downsizing, subcontracting, joint ventures, strategic alliances, and other collaborative and network-based alternatives which are typically facilitated by virtual teams. Virtual teams are geographically and organizationally dispersed teams that function over time zones. Due to such dispersion, physical contact in virtual teams is reduced or lacking altogether which means that collaboration is enabled by IT-solutions such as computer-based communication. This kind of electronically facilitated team work is known to imply opportunities as well as challenges for today's global e-leaders. Research on virtual teams suggests that organizational success greatly depends on leadership. However, it remains unclear what kind of leaders, and more specifically, which leadership skills, behaviors or practices contribute to effective virtual teams. To add knowledge on the field and fill such research gap, this article aims at exploring e-leadership and answering these questions.

Summary. This article focuses on the technological changes leaders are facing in a global market and the associated challenges to meet their objectives. The focus of the article is

on virtual teams and the challenges leaders of these teams experience. The author notes differences in virtual teams versus collocated teams that provide challenges, including how employees are selected, organizational structure, leadership functions and practices, methods of communication and decision-making, relationship building, and physical contact among employees. Specific challenges include the ability to convey social presence that is inherent in face-to-face environments, and the lack of information-rich nonverbal cues, such as facial expression, voice inflection, and gestures. The author also notes that face-to-face communication minimizes information loss due to simultaneous usage of multiple communication channels. The authors identify the main challenges e-leaders face as related to trust creation, maintaining team members' trust, distance, time-zone related issues, and problems arising from cultural differences and diversity. However, e-leaders must rely on technology to relay information, and communication using technology may generate problems related to misunderstandings, information diffusion, and knowledge management. Additionally, a big challenge for e-leaders may be the ability to inspire and motivate team members to remain active and to continuously communicate with each other, which increases cohesion and motivation, enhances trust, and finally leads to successful team performance.

Munkvold, B. E., & Zigurs, I. (2007). Process and technology challenges in swift-starting virtual teams. *Information & Management, 44*(1), 287-299. Retrieved from https://brage.bibsys.no/xmlui/bitstream/handle/11250/136214/Info_man_2007.pdf?sequence=1&isAllowed=y

Abstract. Virtual teams often face tight schedules and a need to start quickly and perform instantly. The goal of our study was to enhance understanding of the challenges faced by such teams. We used time–interaction–performance theory as the framework for following the

processes and functions within virtual teams working on a systems development task. Our study provided a detailed examination of the group process, applied to virtual teams working under time pressure. The challenges faced by virtual teams in such settings showed that teams must work to enhance their effectiveness in multiple dimensions.

Summary. Munkvold is a professor of information systems at Agder University College in Norway. Munkvold's main areas of interest are implementation and use of collaboration technologies. Zigurs is a professor and department chair of Information Systems and Quantitative Analysis in the College of Information Science Technology at the University of Nebraska at Omaha. Zigurs' research includes areas of design, implementation, and use of collaboration technologies. Having collaborated to write "Process and technology challenges in swift-starting virtual teams," they focused on the process and technology challenges faced by virtual teams. Munkvold and Zigurs (2007) explain that a swift-starting team is a team "formed in response to specific needs and typically must perform quickly" (p. 287). Munkvold and Zigurs devised a study to answer the following questions: (a) What patterns, practices, or types of activities must swift-starting virtual teams carry out to achieve effective process and outcomes? (b) What types of process structures and technology support should be provided for facilitating such teams?

Their findings include a list of positive and negative influences on the outcomes of virtual teams. The positive influences include team members who are adept in the use of technology, trust among team members, well-defined task structure, variation in the experience levels of team members, and acknowledgement and management of difficulties encountered in virtual teamwork. The negative influences include time zone differences among team members, a

mismatch in expectations about when and how much the teams should work, cultural differences among team members, and lack of norms for communication.

This source is important for this study because it gives actual data on the advantages and challenges faced by virtual teams from different research methods.

Plotnick, L., Hiltz, S. R., & Privman, R. (2016, September). Ingroup dynamics and perceived effectiveness of partially distributed teams. *IEEE Transactions on Professional Communication, 59*(3), 203-229. doi:10.1109/TPC.2016.2583258

Abstract. Research problem: Partially distributed teams (PDTs) are virtual teams that consist of at least two distinct geographically dispersed subgroups that communicate mainly through information and communication technology (ICT). As such teams become increasingly prevalent, it is important to understand how to manage them to maximize team effectiveness. The perceptions of effectiveness of PDTs may be significantly decreased when they are characterized by ingroup dynamics, consisting of preferential attitudes and actions toward collocated members, with accompanying conflict and lack of trust in regard to the distant subteam(s). Research questions: Do ingroup dynamics negatively impact perceptions of effectiveness in PDTs and, if so, how strongly? What factors can lessen ingroup dynamics — specifically, can training or reliable ICT support decrease ingroup dynamics? Does organizational context affect these relationships? Does whether or not the PDT is international affect these relationships? Does the number of subgroups in a PDT affect these relationships?

Summary. This article focuses on partially distributed teams (PDTs). A PDT occurs when at least one subgroup has two or more members of a team that are not geographically collocated. Other configurations of a PDT can be a fully distributed virtual team, in which no members are collocated, and a hybrid team, in which the full team meets face-to-face sometimes

but interacts through technology on a daily basis. In this research article, the authors used quantitative data from a survey to identify the relationship between ingroup dynamics, which occurs when members of subgroups in an organization, group, or society identify with that subgroup rather than the organization, group, or society as a whole, and exhibit a more favorable attitude toward each other than they do toward the team members of other subgroups, and team effectiveness, defined as the perceived quality of the team work process (Plotnick et al., 2016). The main focus of this study was two research questions: (a) Do ingroup dynamics negatively impact perceptions of effectiveness in PDTs and, if so how strongly? (b) Under which circumstances are ingroup dynamics lessened?

The results of the study were that ingroup dynamics has a strong negative relationship with the perception of effectiveness in PDTs. In addition, the authors found that technology reliability and training reduces ingroup dynamics. However, in one telecommunications company the authors studied, training actually increased ingroup dynamics, which indicates that training may not always be beneficial, depending on the organizational culture and the type of training provided by the organization. These results provide managers with guidance on the issues of PDTs on which to focus to promote the effectiveness of PDTs.

Purvanova, R. K. (2014, February). Face-to-face versus virtual teams: What have we really learned? *The Psychologist-Manager Journal, 17*(1), 2-29. doi:10.1037/mgr0000009

Abstract. While the issue of differences between virtual and face-to-face teams has garnered much interest, different conclusions have been reached. Specifically, the experimental literature on virtual teams has strongly suggested that virtual teams are inferior to face-to-face teams on most outcomes, whereas emerging field research has tended to show just the opposite pattern of results. Hence, the crucial issue examined by this paper is, which literature can we

trust? Through a series of qualitative reviews and quantitative meta-analyses, the paper shows that (1) field reports have generally painted virtual teams in a positive light, (2) experimental studies have generally done the opposite, and, most importantly, (3) when more realistic methodologies and/or longitudinal investigations are employed in experimental research, results tend to be consistent with those reported in industry. As both academicians and organizational decision-makers reach conclusions informed by the state of the art in science, this finding has important practical implications.

Summary. This article focuses on the advantages of virtual teams. The author notes that research on the effectiveness of virtual teams has produced mixed results. According to Purvanova (2014), organizations have embraced electronic communication technologies such as e-mail and instant messaging that allow virtual teams to succeed.

Through her research, the author found that the use of virtual teams resulted in cost savings due to the reduction in travel expenses and other logistical expenditures. Purvanova (2014) also asserts that virtual teams make organizations more flexible, allowing them to handle the pressures created by increasing business globalization and competition, changing organizational structures and growing customer demand for timely and efficient services. However, Purvanova, concludes that virtual teams are inferior to traditional face-to-face teams because virtual teams cannot match the effectiveness of face-to-face communication. Videoconferencing–a technology that comes the closest to face-to-face communication–is costly and still not very efficient. Purvanova also states that less than one third of the virtual teams surveyed in a recent large-scale study reported ever using videoconferencing.

This research is important for this study because it gives the audience more depth on the challenges virtual teams face and reasons why virtual teams can be unsuccessful.

White, M. (2014). The management of virtual teams and virtual meetings. Business Information Review, 31(2), 111-117. doi:10.1177/0266382114540979

Abstract. Most organizations now make use of virtual teams. Many of these virtual teams started out as physically co-located teams but with the need to reduce travel and related costs, audio and video technologies were introduced. However, the dynamics and management of virtual teams are different in almost every respect to co-located teams. The benefits and challenges of virtual teams are outlined, with particular reference to the effective management of language, cultural, time and location aspects of virtual teams and virtual meetings.

Summary. Martin White started managing virtual teams in the early 1970s. His article focuses on the benefits and challenges of virtual teams and how organizations use virtual teams. Benefits of virtual teams are identified as having a team that has a unity of purpose, social structure, and responsibility for outcomes. Challenges of virtual teams are identified as: language barriers, different working weeks, different times to start and end the working day, different vacation periods, different public holidays, daylight savings time adjustments, and different date formats. White (2014) asserts that not all good managers are good virtual team managers and states that virtual team managers must adapt a style that works best for them.

White (2014) uses the word TEAM to provide a mnemonic for virtual teams, which stands for: Trust, Engagement, Achievement, and Membership. White notes the following best practices for the effective management of virtual teams: understand the skills and experience each team member has, maintain a close working relationship with each team member, take additional time to prepare for meetings, use conferencing and social media applications to help the team achieve objectives, and cultivate the ability to motivate team members. White also recommends audio and web conferencing collaboration tools for virtual teams.

This article is useful because it provides a broader description of the benefits and challenges of virtual teams and how to successfully manage them.

Best Practices of Virtual Teams

Dulebohn, J. H., & Hoch, J. E. (2017). Virtual teams in organizations. *Human Resource Management Review*. https://doi.org/10.1016/j.hrmr.2016.12.004

Abstract. Organizations continue to widely adopt virtual teams as a primary way to structure work and the recent growth in utilization has outstripped theory and research on virtual teams. The explosive growth in virtual team use by organizations and the inherent challenges of virtual teams highlight the need for theory and research to inform organizations in designing, structuring and managing virtual teams. Therefore, the purpose of this special issue is to (a) advance theory and research on virtual teams, (b) offer new directions for research on the topic, and (c) contribute to efforts to enhance the effectiveness of virtual teams in organizations. Toward this end, in this introduction we provide a brief overview of virtual teams and present an input-process-output framework to contextualize and organize the eight papers appearing in this special issue.

Summary. The authors describe virtual teams as work arrangements where team members are geographically dispersed, have limited face-to-face contact, and work interdependently through the use of electronic communication media to achieve common goals. The authors also present the advantages and challenges of virtual teams and present virtual team best practices. Advantages of virtual teams presented by the authors include: the ability to assemble teams that maximize functional expertise by including professionals who are geographically dispersed, enabling continuous 24/7 productivity by utilizing employees from different time zones, cost savings, and knowledge sharing across geographic boundaries and

organizational units. Challenges of virtual teams include: communication and collaboration difficulties, low levels of media richness, potentially lower team engagement by team members, and challenges in monitoring and managing the virtual teams. The authors recommend the following best practices to uncover and resolve conflicts across distance: motivate team members by providing direction and specific goals, monitor environmental conditions, update/revise goals and strategies as environmental contingencies warrant, and facilitate collaboration and cohesion among team members. The authors also mention that leaders should monitor team members' performance, and build trust and cohesion by empowering all employees and providing opportunities for them to work together. This approach ensures individuals will put the team's interests above self-interest and should help facilitate cohesion among individuals drawn from across the team.

This source is important for this study because it provides an overview of virtual teams and provides best practices to uncover and resolve virtual team conflicts.

Horwitz, S. K., & Santillan, C. (2012, December). Knowledge sharing in global virtual team collaboration: Applications of CE and thinkLets. *Knowledge Management Research & Practice, 10*(4), 342-353. doi:10.1057/kmrp.2012.39

Abstract. Although a global virtual team (GVT) can provide organizations with increased competitive advantages and greater flexibility due to its unique ability to transcend traditional boundaries of time, locations, and organizational constraints, knowledge sharing in globally dispersed and culturally diverse members also poses unique challenges to organizations wishing to capitalize on diverse knowledge of GVTs. This work, therefore, examines extant literature on collaboration engineering (CE) and thinkLets and further proposes that CE and thinkLets can help organizations develop predictable patterns of knowledge-sharing behaviour

and a sense of structure in GVT collaboration. Implications of using CE and thinkLets for organizational practice and research are also discussed in the virtual collaboration context.

Summary. This article focuses on the issues of knowledge sharing in virtual teams due to geographical distance, diversity of team members, membership background, absence of prior work history, and lack of direct member interactions. This article also focuses on the process-driven, efficacious, and sustainable technology options which can help organizations facilitate knowledge sharing in virtual collaboration among the dispersed team members. The authors review literature on collaboration engineering (CE) technology and thinkLets. CE is a research-based approach to designing and deploying collaboration processes for high-value recurring team tasks, and thinkLets within CE are the units of facilitation which can be integrated into groupware tools in order to develop streamlined activities for a given team task. The authors state that the benefits of a diverse knowledge base of global virtual team members can be translated into a competitive advantage for an organization only when the knowledge base is effectively captured and shared among the team members. However, the authors state that shared understanding can be difficult to achieve when the dispersed team is connected through technology without face-to-face interactions.

This source is important to this study because knowledge sharing is key to having a successful virtual team. Team members must collaborate and trust each other to share the knowledge through a knowledge base rather than sharing the knowledge face-to-face. This source provides valuable examples of potential approaches to virtual team collaboration and knowledge sharing.

Iorio, J., & Taylor, J. E. (2015, February). Precursors to engaged leaders in virtual project teams. *International Journal of Project Management, 33*(2), 395-405. https://doi.org/10.1016/j.ijproman.2014.06.007

Abstract. Virtual project teams are becoming common organizational structures because firms seek to leverage geographically distributed, specialized knowledge to execute work. Performance in virtual teams can be increased through effective leadership. Although a growing body of research exists that identifies how effective leaders engage in interactions with their teams, we know less about how to strategically identify candidates for leadership positions who have high potential to become engaged leaders. Our research fills this gap by exploring how prior experiences can be used to predict engagement in interactions associated with effective leadership. Our research is based on analysis of 20 graduate students in four simulated virtual project teams executing a construction design and planning task. Results suggest that in virtual teams, engagement is conditioned by the technological context in which the work is executed. Our findings have implications for existing leadership training programs and contribute to theories about the appropriateness of shared leadership models for virtual project teams.

Summary. This article focuses on how the challenges of virtual teams can be addressed through effective leadership. The authors note that ineffective leadership, interpersonal relations, and technology are all factors that contribute to breakdowns in virtual teams. This article focuses on the variety of leadership qualities, behaviors, processes, and structures an effective leader must possess in order to successfully lead a virtual team. One specific leadership quality that makes a leader effective in leading a virtual team includes being influential to his/her followers. Effective leaders must balance their own influence with their followers' influence in order to manage team power dynamics because followers can (positively or negatively) shape the

behavior of leaders. Successful leaders of virtual teams engage with their followers throughout the life-cycle of a project because lapses in engagement can lead to task and role confusion, decreased motivation, and ultimately, lack of engagement by other team members. Processes and structures that work well with virtual teams include managing interactions between workers and their project tasks through a transactional leadership style. There are a range of ways that effective leaders engage in transactional interactions, including: (a) clarifying and defining the scope of tasks and team member roles in the project, (b) delegating work tasks to followers, (c) following through on these tasks to ensure that they are aligned with the project goals, (d) incrementally assessing task progress, and (e) iteratively providing feedback throughout the project lifecycle.

The authors present two different leadership styles: transactional and transformational or charismatic. Transformational leadership is described as centered on managing the interpersonal relationships between people while transactional leadership is focused on facilitating the execution of task in the creation of products. According to the authors transactional leadership focuses on the task-related exchange of actions and rewards between follower and leader, while transformational leadership emphasizes a person-orientation by aligning followers' needs with the organization's task and goals. Some scholars view these leadership styles as complementary to each other and assert that project managers who can adopt transactional and transformational leadership may improve team communication, collaboration and cohesiveness.

This article also provides research in selecting an effective leader for virtual teams. The authors state that an effective virtual team leader is not necessarily someone who has the qualifications to lead a traditional face-to-face team or has completed the traditional leadership training program. Iorio and Taylor (2015) note that the research suggests that leaders of virtual

teams should be selected based on their previous work experience leading virtual teams or should have some sort of work experience with virtual teams.

This source is important to this study because it provides research and data about the necessary traits of an effective leader of a virtual team.

Johnson, K. (2010). Virtual leadership: Required competencies for effective leaders. In R. Heller, A. Laurito, K. Johnson, M. Martin, R. Fitzpatrick, & K. Sundin, *Global teams: Trends, challenges, and solutions: A collection of white papers* (pp. 39-52). Ithaca, NY: Center for Advanced Human Resources, IRL School, Cornell University. Retrieved from https://est05.esalestrack.com/eSalesTrack/Content/Content.ashx?file=4578f59e-21b3-4a2c-bbfe-63e53af3f5dc.pdf

Abstract. With the advent of the internet and host of communication tools that have followed, teams today are becoming increasingly dispersed and diverse. Studies are now being conducted to understand how leadership has or should evolve in order to meet the changing needs and demands of these new and different communities. This paper explorers leadership in virtual settings and how it's changing as more teams move away from traditional team environments. Specifically, it looks at virtual leadership roles, responsibilities, and competencies, identifies challenges unique to virtual teams, and considers important global implications for effective leadership.

Summary. This paper focuses on leadership in a virtual setting. The author compares collocated teams to remote teams and notes that virtual teams present greater complexity due to expanded geographies and time zones; new cultures; and different laws, regulations, and business processes. The author also focuses on the responsibilities and roles of a virtual leader, including developing a group of individuals into a coherent and well-integrated work unit that

provides the capability for the team to self-manage. To achieve this goal, leaders should provide a team orientation, which includes motivational factors like promoting a common goal, creating positive affect, and shaping perceptions. Finally, the author notes the competencies required of global virtual leaders, including the three roles a virtual leader holds: (a) team liaison, who continually scans and interprets team events and the overall environment, (b) direction setter, who ensures that all actions have a specified purpose that is in line with the team's overall goals, and (c) the operational coordinator, which includes identifying or developing the right resources to tackle problems or tasks and minimize process losses.

This source is important to this study because it provides the advantages and disadvantages of virtual teams and focuses on the responsibilities of leaders of virtual teams.

Laurito, A. R. (2010). Building teams from a distance. In R. Heller, A. Laurito, K. Johnson, M. Martin, R. Fitzpatrick, & K. Sundin, Global teams: Trends, challenges, and solutions: A collection of white papers (pp. 29-38). Ithaca, NY: Center for Advanced Human Resources, IRL School, Cornell University. Retrieved from https://est05.esalestrack.com/eSalesTrack/Content/Content.ashx?file=4578f59e-21b3-4a2c-bbfe-63e53af3f5dc.pdf

Abstract. Virtual teams are emerging with increased frequency in organizations around the globe. Successful virtual team building is challenging because teams are frequently composed for short periods of time and are created to tackle specific tasks. Establishing an effective virtual team requires exemplary leadership, easy access to technology and team training, as well as rules to protect team members that address differences in time zones, cultures and languages. Creating and maintaining trust, along with open lines of communication among

team members has also been shown to be vital for virtual team success. While forming effective virtual teams is difficult, with effort and awareness of all parties involved, it can be achieved.

Summary. This paper focuses on the establishment of trust between team members, frequent member intercommunication, and effective leadership, which all contribute to virtual team success. The author offers the following suggestions to build trust among team members: (a) When possible, have in-person interactions, which contribute to the creation of *swift trust*. (b) When the team is unable to have in-person interactions, the author states that virtual teams can enable trust by increasing the frequency of e-mails sent between team members. For example, virtual team members that communicate frequently regarding task-related information have been shown to have stronger working relationships and higher levels of trust than those who do not communicate as frequently (Laurito, 2010). This paper provides best practices in forming a successful virtual team, including offering virtual team member training, engaging in team building exercises, and ensuring the necessary support from upper management is provided.

This source is important to this study because it provides best practices for virtual team success and focuses on the responsibilities of leaders of virtual teams.

Paul, R., Drake, J. R., & Liang, H. (2016, September). Global virtual team performance: The effect of coordination effectiveness, trust, and team cohesion. *IEEE Transaction on Professional Communication, 59*(3), 186-202. doi:10.1109/TPC.2016.2583319

Abstract. Research problem: Subgroup formation in global virtual teams could negatively impact team performance due to difficulties in coordination, trust, and team cohesion. Research questions: What roles do trust and team cohesion play in the relationship between coordination effectiveness and team performance of global virtual teams with two distinct subgroups? Literature review: Prior research suggests that coordination effectiveness on team

performance is most strongly impacted by coordination of knowledge. This effectiveness is mediated by trust and team cohesion. However, we have a poor understanding of trust and team cohesion dynamics on intergroup relationships in global virtual teams. Methodology: A survey was conducted with 14 teams with a total of 112 participants in the US and India. The teams were tasked with evaluating customer-relationship-management best practices for a global environment. Results and discussion: We evaluated how the process of effective coordination for teams composed of two collocated subgroups is mediated by individual perceptions of out-group trust and overall team cohesion. Our findings show that individual trust and team cohesion share a reciprocal impact on each other, suggesting that effective coordination in virtual teams can create a positive feedback loop with trust and cohesion, improving overall project performance. Implications for theory and practice include the virtuous cycle that trust and cohesion create in global virtual team coordination and the necessity of establishing appropriate project coordination systems and processes to promote both aspects and, thus, achieve excellent project performance for collocated subgroups.

Summary. This article focuses on trust and team cohesion and the affect they have on global virtual teams. This article was written to answer the research question, "What role does trust and team cohesion play in the relationship between coordination effectiveness and team performance of global virtual teams consisting of two nationalities?" To answer this question, a research model was developed to collect data from 14 global virtual teams. This research was conducted to measure coordination effectiveness, trust, and team cohesion. The result of the authors' research indicates that individual trust and team cohesion have positive impacts on a virtual team. The authors state that developing trust among virtual team members and team cohesion improves the overall performance of the team.

The authors note that trust consist of three factors: (a) ability, (b) benevolence, and (c) integrity. Ability allows a team member to depend on another team member's skills, knowledge, connections, and systems. Benevolence allows a team member to depend on another person's goodwill. Finally, integrity expresses the moral certitude that a person will act in accordance with rational principles. The authors note that team trust is built through regular communication, creating a shared understanding of activities to be performed, establishing norms around communication patterns, considering individual differences in preferences for working virtually, and providing virtual team members with a realistic preview of the potential for feeling detached.

Team cohesion refers to individuals within a group coming together as a perceived single entity with shared norms, values, and goals. The authors note that when demographic and cultural differences appear in a group, they can cause the group to split apart. The authors recommend building team cohesion by effectively coordinating virtual communication. The effectiveness of this coordination is critical for establishing trust among the team members and to develop team cohesion, which results in high team performance.

This source is important to this study because trust and cohesion are two factors that positively impact the success of global virtual teams. This article provides best practices in building trust and cohesion among virtual team members.

Technology for Use With Virtual Teams

Shachaf, P. (2008, March). Cultural diversity and information and communication technology impacts on global virtual teams: An exploratory study. *Information & Management, 45*(2), 131-142. https://doi.org/10.1016/j.im.2007.12.003

Abstract. Modern organizations face many significant challenges because of turbulent environments and a competitive global economy. Among these challenges are the use of information and communication technology (ICT), a multicultural workforce, and organizational designs that involve global virtual teams. Ad hoc teams create both opportunities and challenges for organizations and many organizations are trying to understand how the virtual environment affects team effectiveness. Our exploratory study focused on the effects of cultural diversity and ICT on team effectiveness. Interviews with 41 team members from nine countries employed by a Fortune 500 corporation were analyzed. Results suggested that cultural diversity had a positive influence on decision-making and a negative influence on communication. ICT mitigated the negative impact on intercultural communication and supported the positive impact on decision-making. Effective technologies for intercultural communication included e-mail, teleconferencing combined with e-Meetings, and team rooms. Cultural diversity influenced selection of the communication media.

Summary. This article focuses on cultural diversity and the use of information and communication technology in a global virtual team. The author mentions benefits of global virtual teams such as access to larger pools of skills that can reduce development time. However, the author also notes that global virtual teams face greater challenges compared to face-face-teams. The author states that the traditional communication mechanisms are lost or distorted, and vocal and nonverbal communication cues are often missed in a global virtual team. The author also mentions that building trust among team members and overcoming feelings of isolation and detachment can be challenging in a global virtual team.

The focus of this study is to determine how diversity within global virtual teams impacts team effectiveness. The author studied whether the effect of cultural diversity among global team

members was diluted, similar, or amplified in virtual settings compared to traditional face-to-face settings. The author conducted this study with the hope of answering two questions: (a) How does cultural diversity in virtual teams influence team effectiveness? and (b) How do communication technologies mediate the relationship between cultural diversity and team effectiveness?

To answer these questions the author recruited 41 individuals from nine countries to participate in the study. The author conducted 41 interviews; 16 were completed face-to-face and 25 were completed via telephone. After analyzing the results of the interviews, the author concluded that cultural diversity has both positive and negative effects on global virtual team effectiveness. The individuals that participated in the study stated that the negative effects were due to challenges posed by intercultural communication, and the positive effects were due to the potential for better decision-making.

This source is important to this study because it provides data from a study of global participants who work in virtual team settings. The article provides information regarding cultural diversity and how it is linked to team effectiveness in a global virtual team setting.

Thomas, D. M., & Bostrom, R. P. (2010, March). Vital signs for virtual teams: an empirically developed trigger model for technology adaptation interventions. *MIS Quarterly, 34*(1), 131-142. http://www.jstor.org/stable/20721417

Abstract. This study explores how team leaders sense the need for technology adaptation intervention in distributed, computer-mediated ("virtual") teams. Analysis and coding of critical incident data collected in interviews of practicing leaders produce a five-trigger model including (1) external constraint, (2) internal constraint, (3) information and communication technology (ICT) inadequacy, (4) ICT knowledge, skills, and abilities inadequacy, and (5) trust and

relationship inadequacies. The resulting five-trigger model provides key contributions including (1) a diagnostic tool for examining real, multi-trigger team technology adaptation contexts, enabling better leader training and evaluation as well as improved research on team technology adaptation and interventions and (2) a better understanding of the relationship between the technology structure strength indicators in adaptive structuration theory and the need for team technology adaptation intervention.

Summary. This article focuses on how virtual team success is partly due to effective team technology adaptation during projects. The authors describe technology adaptation as a process in which a team changes the way it uses one or more information and communication technologies for completing its work. The authors understand that virtual teams rely on technology in order to be successful; the article identifies how a team leader may sense a technology adaptation that requires an intervention.

The authors identified potential situations that can cause members of a virtual team to engage in technology adaptations, including: (a) the team leader senses the need to intervene and manage a technology adaptation, and (b) project leaders recognize problems as they are occur and are able to fix them, while understanding the role technology plays in the problems. The authors assert that how well the team leader understands the role of technology influences his or her ability to resolve the issues.

This source is important to this study because it gives the reader an understanding of how important it is to have a process to understand, recognize and adapt technology used in virtual teams.

Weimann, P., Pollock, M., Scott, E., & Brown, I. (2013, December). Enhancing team performance through tool use: How critical technology-related issues influence the

performance of virtual project teams. *IEEE Transactions on Professional Communication, 56*(4), 332-353. doi:10.1109/TPC.2013.2287571

Abstract. Research problem: The project management of virtual teams differs from that of traditional ones. Traditional project risks, such as complexity, the uncertainty of factors influencing the project, and the high interdependency of project tasks must be managed alongside changed temporal, geographic, and cultural dimensions. Only a few studies have investigated the effect of critical technological issues, such as wrong tool selection or limited internet access on performance as well as team and team member satisfaction in virtual work settings. Research questions: How do critical technology-related issues concerning the selection and use of web-based tools influence the performance and satisfaction of virtual project teams? Literature review: Instead of categorizing virtual teams as a type of team that contrasts with traditional or face-to-face teams, the focus has shifted to virtualness as a characteristic present in all teams. Project teamwork is often integrated in university degree programs in order to prepare students appropriately for real-life projects. While these student teams are often not geographically spread across countries, they have a high degree of virtualness because of their diverse team composition, the necessity for working at different places, and the limited face-to-face meeting opportunities. Performance, effectiveness, and satisfaction are central issues in the evaluation and measurement of project teams: Team performance is often evaluated on the basis of acceptance of a specified output by a customer. Through specific mediating processes, team performance can alternatively be assessed by inquiring the team's perception on their performance. Effectiveness can be defined as the achievement of clear goals and objectives and it is often related to the team's performance. Finally, satisfaction can be defined as having three dimensions-satisfaction with the team, the satisfaction of meeting customer needs, and general

satisfaction with extrinsic rewards and work. Technology use is substantial for distributed teamwork and can be assessed by the extent to which it supports communication, collaboration, and project-management tasks. Methodology: Fifteen teams were observed and interviewed over a two-year period. The resulting data were analyzed using a Grounded Theory approach, which revealed how the selection and use of tools for communication, collaboration, and project management in the different project activities influenced the team's performance. Results and conclusions: Our results contribute to practice by providing a number of guidelines for the management of virtual teams as well as knowledge required by companies wishing to launch projects with virtual teams. Differing performances of teams can, in many cases, be attributed to such conditions as: internet availability and bandwidth; lack of training for certain tools; the selection and appropriate use of tools; integrated tool support for task management; as well as the promotion of transparency about progress made. It was found that restrictions in internet access of even a single member within a team limited the team's technological choices, which affected the team's performance.

Summary. This article focuses on the enhancement of team performance through the use of technology. This article investigates how technology-related issues influence virtual team performance and virtual team member satisfaction. The authors pose the following questions: (a) How does the selection and use of tools for communication, collaboration, and project management influence a virtual team's performance in a project? (b) How does the selection and use of tools for communication, collaboration and project management influence a virtual team's and team member satisfaction in a project? (c) How do critical technical issues influence the selection and use of tools for communication, collaboration and project management and how do they affect team performance? (d) How do critical technical issues influence the selection and

use of tools for communication, collaboration and project management and affect team and team member satisfaction? And, (e) How does the context of project, team and team members in the selection and use of tools for communication, collaboration, and project management influence team performance, and team and team member satisfaction?

The authors assert that mobile technology, globalization, and the internet, supported by high bandwidth, are the causes of the reduction of face-to-face interactions. Technologies such as groupware, videoconference, mobile phones, and the internet are all tools people can use to work away from the office. One of the biggest challenges for virtual teams is communication; however, technology has provided different methods that allow team members to communicate with each other. According to the authors, collaborative work technologies can be classified in four main dimensions: (a) same time/ same place (such as networked computers in a laboratory), (b) same time/ different place (such as chat, Skype, phone conference, or phone), (c) different time / same place (such as bulletin boards), and (d) different time / different place (such as e-mail and text message).

The authors conclude that establishing trust in the team through the use of communication technology is essential. The authors also note that to monitor a virtual team's progress using technology, it is important to have a technical infrastructure that works well. The authors note that to enhance the visibility of virtual team members, the technology should help manage the tasks and promote transparency about the work progress of the project. Lastly, the authors assert that the virtual team setting should enable each team member to benefit from the team.

This source is important to this study because it provides more examples of technology that assist in making a virtual team successful.

Conclusion

Virtual teams are "geographically and organizationally dispersed teams that function over time zones (Lilian, 2014, p. 1251). Virtual teams are becoming common because organizations can use workers with specialized knowledge, regardless of their locations (Plotnick, Hiltz, & Privman, 2016). DuFrene and Lehmen (2011) note that virtual teams encounter a range of challenges, including lack of verbal cues, isolation, lack of cohesion, and the absence of essential behaviors such as commitment, cooperation, communication, and contribution. A common challenge experienced by virtual teams is collaborating effectively (Dulebohn & Hoch, 2017; Laurito, 2010).

This annotated bibliography presents literature that examines the advantages and disadvantages of virtual teams, best practices of virtual teams, and technology for use with virtual teams. The ultimate goal of this study is to identify best practices and tools to meet the collaboration challenges faced by global organizations with distributed personnel.

Advantages and Disadvantages of Virtual Teams

"As international businesses activity increases, more and more work is done by virtual teams with culturally diverse members" (DuFrene & Lehman, 2011, p. 5). According to DuFrene & Lehman (2011), virtual teams have advantages that include cost savings, labor pool enhancement, facility and environmental benefits, employers' efficiencies, and better decision making (DuFrene & Lehman, 2011). Purvanova (2014) also notes the flexibility that virtual teams afford organizations, allowing them to handle the pressures created by increasing business globalization and competition, changing organizational structures, and growing customer demand for timely and efficient services. Heller (2010) also notes the ability for an organization to increase globalization and allow for rapid knowledge transfer across different time zones with

the utilization of virtual teams. By employing global virtual teams (GVTs) "...organizations can combine the best expertise available for task performance regardless of geographic location" (Shachaf, 2008, p. 131). Heller (2010) also identified the cost savings that virtual teams can impart, noting that virtual communication tools can offer a cost-effective way of communicating across time zones and of doing business. White (2014) identifies the benefits of virtual teams as including unity of purpose among team members, social structure, and responsibility for outcomes.

In virtual teams, many team members may never meet each other or work with one another in person, which can lead to a variety of problems (DuFrene & Lehman, 2011). Shachaf (2008) notes "...in spite of their advantages, [global virtual teams] face greater communication challenges than face-to-face teams; traditional communication mechanisms are lost or distorted, and vocal and nonverbal communication cues are often missed" (p. 131). White (2014) identified challenges of virtual teams as language barriers, different working weeks, different times to start and end the working day, different vacation periods, different public holidays, daylight savings time adjustments, and different date formats.

Virtual teams also present disadvantages such as "difficulty communicating and coordinating activities, misunderstandings, feelings of isolation, and poor team leadership" (Purvanova, 2014, p. 5). Horwitz (2012) notes that knowledge sharing in globally dispersed teams is difficult, asserting that the struggle to share knowledge is much more pronounced than among conventional team members. Horwitz (2012) states that shared understanding can be hard to achieve when virtual team members are connected through technology without face-to-face interaction, noting their expectations of what constitutes effective collaborative behavior will differ. Heller (2010) found disadvantages that include technical and logistical problems that can

occur with virtual communication tools, noting that these problems can be time consuming to resolve. Specific issues may include scheduling, coping with time delays, and software issues Heller, 2010).

Munkvold and Zigurs (2007) found four negative factors in virtual teams: (a) time differences, which restricted the possibility of synchronous interaction in international teams, making coordination difficult (b) mismatches in expectations about the work of the team that led to negative project team outcomes, (c) cultural differences that resulted in communication challenges, and (d) variation in experience levels arising from team members with different backgrounds. Purvanova (2014) concluded that virtual teams are inferior to traditional face-to-face teams because virtual teams cannot match the effectiveness of face-to-face communication.

Lilian (2014) notes the challenges virtual teams pose for leaders. Lilian points out that virtual team leaders must rely on technology to relay information, and notes that communication using technology may generate problems related to misunderstandings, information diffusion, and knowledge management. White (2014) notes the difficulty of managing a team you do not see. "A major challenge for managers in their inability to physically observe their employee's performance" (Kurland & Bailey, 1999, p. 59).

Lilian (2014) also identifies a key challenge for virtual team leaders as the ability to inspire and motivate team members to remain active and to continuously communicate with each other, which increases cohesion and motivation, enhances trust, and finally leads to successful team performance. Dulebohn & Hoch also state that there is difficulty in developing "adequate practices to uncover and resolve conflicts across distance, motivate team members, monitor team members' performance, and build trust and team cohesion" (Dulebohn & Hoch, 2017, p. 2). Laurito (2010) found that building trust and team cohesion among virtual team members is a

difficult task. White (2014) concludes that not all good managers are good virtual team managers and states that virtual team managers must adapt a style that works best for them. Most team leaders that work in a virtual team setting agree that managing a virtual team is more difficult than managing a collocated team (Dulbohn & Hoch, 2017).

Best Practices of Virtual Teams

Virtual teams can increase their likelihood of success through the use of best practices (Staples & Webster, 2007). Multiple researchers identified the building of trust among team members as crucial for virtual team success (Laurito, 2010; Paul, Drake, & Liang, 2016). Paul, Drake, and Liang (2016) state that effective coordination in virtual teams can create a positive feedback loop with trust and cohesion, improving overall project performance. Laurito (2010) states that "[c]reating trust within a team is frequently done through face-to-face interactions among team members that take place early in the team's life span. These encounters have been found to be effective in allowing team members to socialize, build rapport with other individuals, and increase understanding of the team's purpose" (p. 29). Laurito also identifies continuous communication as helpful in building team trust and cohesion. However, Laurito suggest that "Many virtual teams experience this as a result of perceived integrity of other individuals, reliable and continuous communication, and effective leadership early in the project life cycle" (Laurito, 2010, p. 30).

Dulebohn and Hoch (2017) recommend the following best practices to uncover and resolve team conflicts across distance: motivate team members by providing direction and specific goals, monitor environmental conditions, update/revise goals and strategies as environmental contingencies warrant, and facilitate collaboration and cohesion among team

members. Horwitz and Santillan (2012) stress the importance of effectively capturing the knowledge base of the distributed team and sharing the knowledge among the team members.

Dulebohn and Hoch (2017) recommend that leaders should monitor team members' performance, and build trust and cohesion by empowering all employees and providing opportunities for them to work together. This approach ensures individuals to put the team's interests above self-interest and should help facilitate cohesion among individuals drawn from across the team (Dulebohn & Hoch, 2017). Iorio and Taylor (2015) note that successful virtual team leaders engage with their followers throughout the life-cycle of a project because lapses in engagement can lead to task and role confusion, decreased motivation, and ultimately, lack of engagement by other team members. Johnson (2010) asserts that virtual team leaders can develop their virtual teams into a coherent and well-integrated work unit that provides the capability for the team to self-manage by providing a team orientation, which includes motivational factors like promoting a common goal, creating positive affect, and shaping perceptions.

Processes and structures that work well with virtual teams include managing interactions between workers and their project tasks through a transactional leadership style. There are a range of ways that effective leaders engage in transactional interactions, including: (a) clarifying and defining the scope of tasks and team member roles in the project, (b) delegating work tasks to followers, (c) following through on these tasks to ensure that they are aligned with the project goals, (d) incrementally assessing task progress, and (e) iteratively providing feedback throughout the project lifecycle (Iorio & Taylor, 2015).

Johnson (2010) notes the competencies required of global virtual leaders, including the three roles a virtual leader holds: (a) team liaison, who continually scans and interprets team

events and the overall environment, (b) direction setter, who ensures that all actions have a specified purpose that is in line with the team's overall goals, and (c) the operational coordinator, which includes identifying or developing the right resources to tackle problems or tasks and minimize process losses. White also states that to have a successful virtual team, team leaders will need to gain additional skills in: (a) "understanding the skills and experience that team members need to have to be effective members of virtual teams, (b) maintaining close working relationships with the managers of team members to ensure they are aware of organizational and office environments in which team members are operating, (c) taking additional time to prepare for a meeting so that, for example, all team members have the documents they need several days in advance, (d) being adept at using conferencing and social media applications to help the team achieve objectives, and (e) being able to motivate team members that they have not met, and may have not chosen to be a member of the team" (White, 2014, p. 116).

Technology for Use With Virtual Teams

Although there is no replacement for face-to-face communication no matter how far technology has evolved, Laurito (2010) notes that technology has progressed to the point where technology can enable individuals to engage in virtual communication. Laurito asserts that "[a]s technology has evolved, time and distance barriers have dissolved, allowing for access to experts, worldwide" (p. 9). Shachaf (2008) notes "[a]dvances in technology facilitate communication and the sharing of information among team members" (p. 131). Weimann, Pollock, Scott, and Brown (2013) state that "[t]echnology use is substantial for distributed teamwork and can be assessed by the extent to which it supports communication, collaboration and project management tasks" (Weimann, Pollock, Scott, & Brown, 2013, p. 332). White observes "...the two dominant technologies for virtual teams are audio conferencing (perhaps

with a web channel to use for PowerPoint slides and other graphics) and video conferencing" (White, 2014, p. 115). Kirkman et al. (2002) believe that all virtual employees must be well versed in using the communication technology necessary to coordinate the efforts of a cross-functional team.

Weimann et al. (2013) assert that technology advances may serves as the catalyst that makes the virtual project teams preferred over the traditional collocated model. "Mobile technology, globalization and the internet, supported by the almost ubiquitous availability of high bandwidth, is reducing the need for face-to-face human interaction. Computer-mediated communication plays an increasing role in many people's lives, and may well transform the virtual team from an innovative source of competitive advantage into the dominant organizational project form" (Weimann et al., 2013, p. 336).

However, in order for technology to become successful, virtual teams and team leaders must be able to adapt to the technology. Thomas and Bostrom (2010) define team technology adaptation as "a process in which a team changes the way it uses one or more information and communication technology (ICT) for accomplishing its work (Thomas & Bostrom, 2010, p. 115). Thomas and Bostrom also state that "one critical enabler of team interaction success consists of effective technology adaptation during projects" (p. 115).

DuFrene and Lehman (2011) acknowledge the usefulness of technology in enabling virtual teams to function, but also assert that technology has a limited role in the success of these teams. "While technology can present its own set of problems, the commonly held view of experts is that virtual team success is due 10% to technology, and 90% to people" (DuFrene & Lehman, 2011, p. 6).

Summary

In the global market, virtual teams are becoming common because organizations see the benefits of cost savings, labor pool enhancements, facility and environmental benefits, increased efficiencies, and better decision-making (DuFrene & Leehman, 2011). However, despite the advantages, virtual teams bring collaboration challenges that can lessen their effectiveness when compared to the traditional face-to-face teams (Shachaf, 2008). To overcome these challenges, team leaders will need to evaluate their leadership approaches, build trust and cohesion amongst their team members, and implement the correct technology to establish effective communication that will allow virtual teams to collaborate, therefore enabling successful global virtual teams.

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